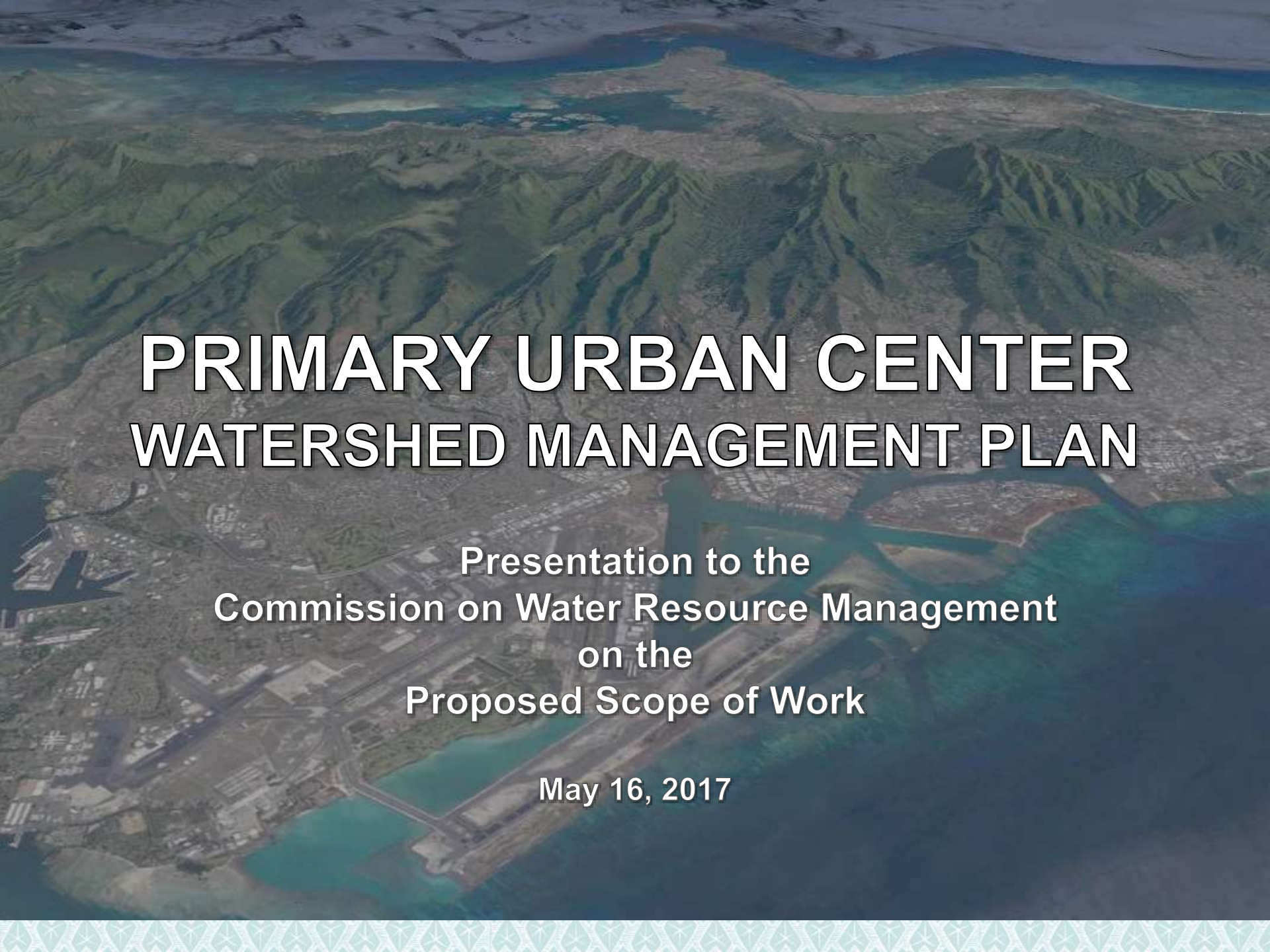


PRIMARY URBAN CENTER
WATERSHED MANAGEMENT PLAN

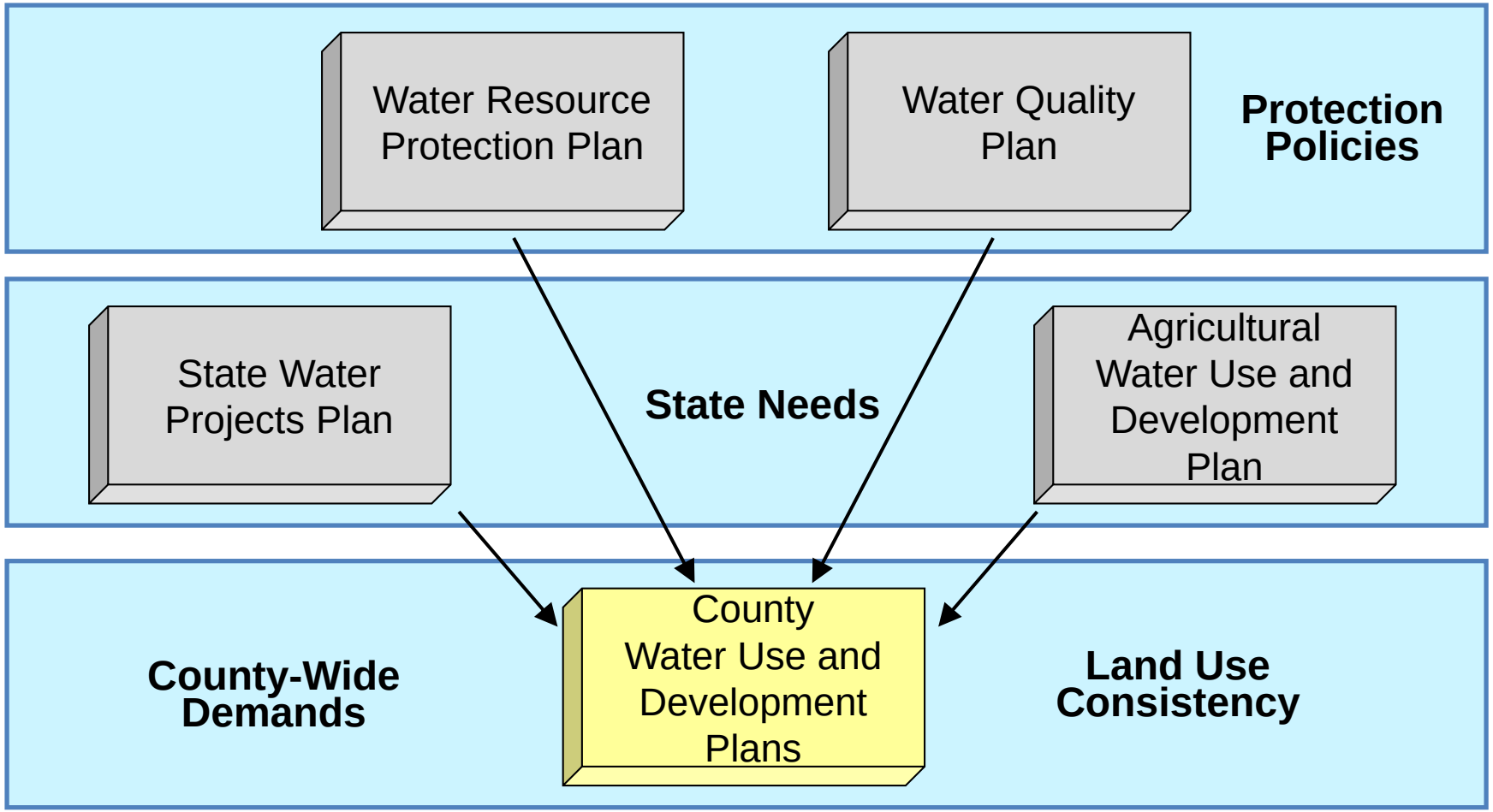
Presentation to the
Commission on Water Resource Management
on the
Proposed Scope of Work

May 16, 2017

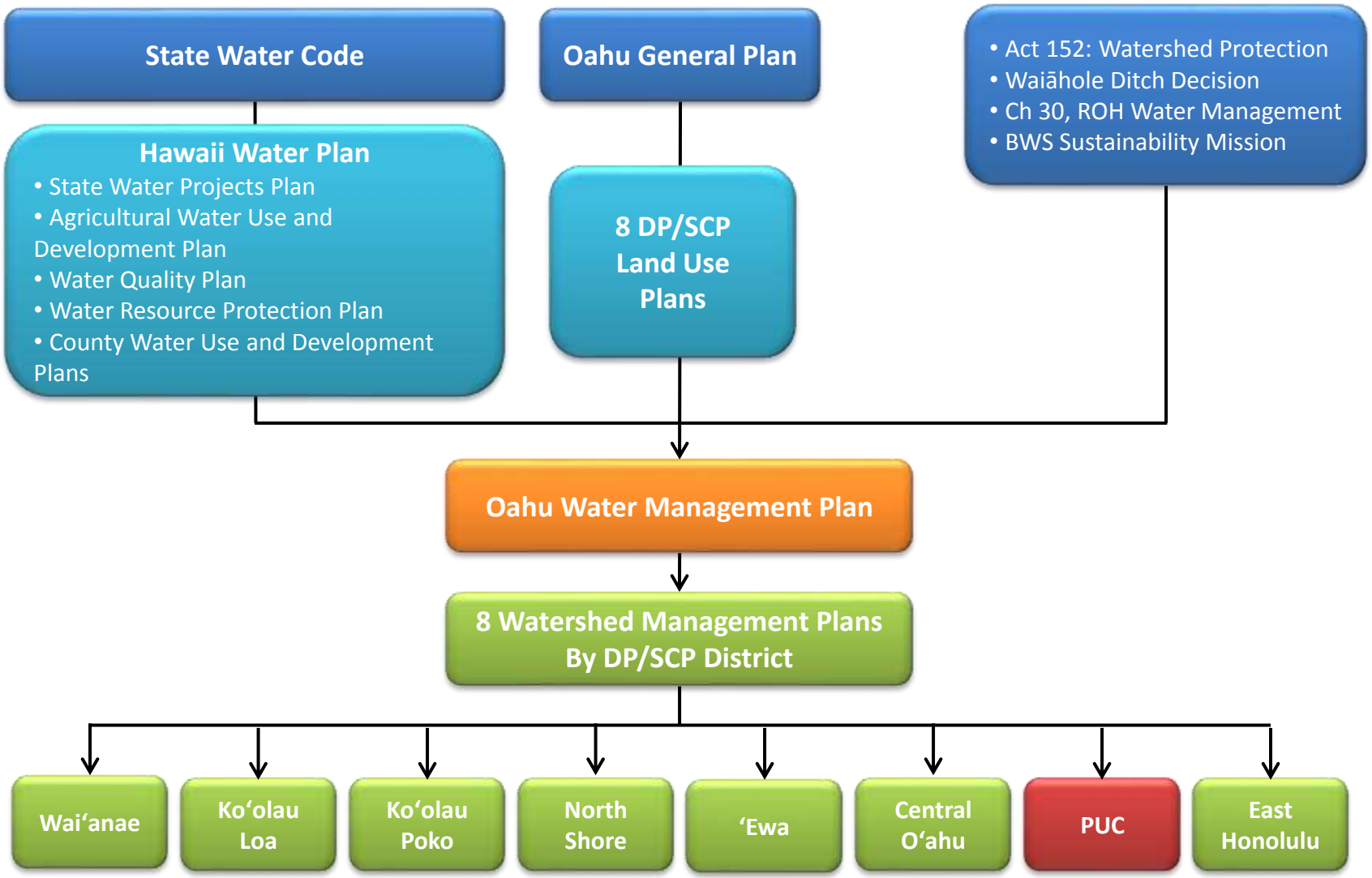
PRESENTATION TOPICS

- O‘ahu Watershed Management Plan
- Honolulu Primary Urban Center
- PUC Watershed Management Plan Proposed Scope of Work
- Major PUC Issues and Approaches

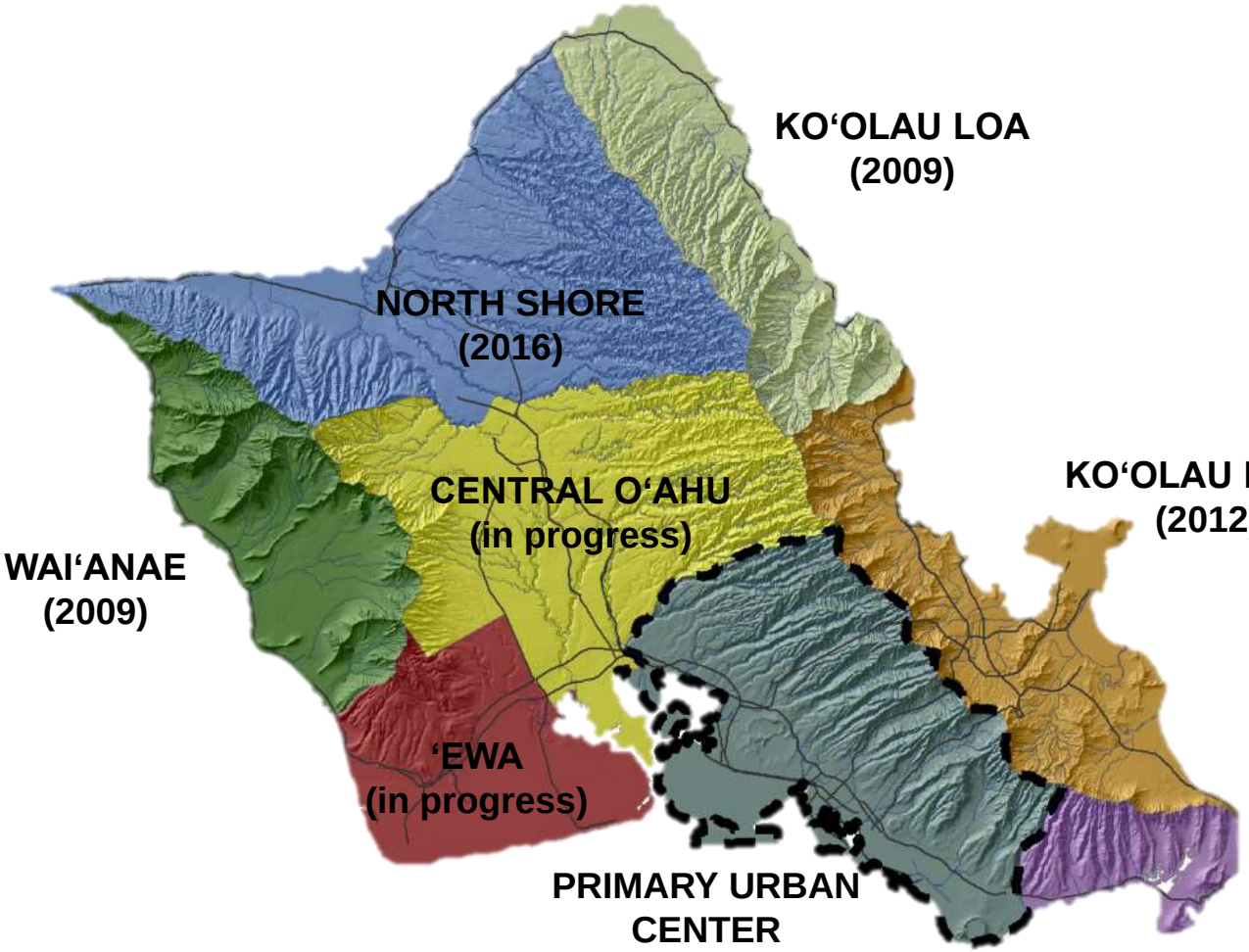
O‘AHU WATERSHED MANAGEMENT PLAN
Hawai‘i Water Plan



O'AHU WATERSHED MANAGEMENT PLAN



Status of the O‘ahu WMP



O‘AHU WATERSHED MANAGEMENT PLAN
Ahupua‘a Planning Concept

- Holistic
- Inter-relationship of resources
- Self-sufficient
- Sustainable
- Kuleana

O‘AHU WATERSHED MANAGEMENT PLAN
Goal

To formulate an environmentally holistic, community-based, and economically viable watershed management plan that will provide a balance between:

(1) the preservation and management of O‘ahu’s watersheds, and

(2) sustainable ground water and surface water use and development to serve present users and future generations.

O‘AHU WATERSHED MANAGEMENT PLAN Objectives

1. Promote sustainable watersheds
2. Protect and enhance water quality and quantity
3. Protect native Hawaiian rights and traditional and customary practices
4. Facilitate public participation, education, and project implementation
5. Meet future water demands at reasonable costs

PRIMARY URBAN CENTER

PRIMARY URBAN CENTER

- Kaimukī/Kahala to Pearl City
- Land Area: ~105 square miles (1/6 of Oʻahu)
- Population: ~440,000 people
- 47% of the PUC is in Conservation (State land use)
- 17 Watersheds
- 16 Ahupuaʻa
- 17 Neighborhood Boards

PROPOSED SCOPE OF WORK
WMP TABLE OF CONTENTS

Executive Summary

1. O‘ahu Watershed Management Plan Overview
2. Watershed Profile
3. Water Use and Projected Demand
4. Objectives, Water Supply and Watershed Management Projects and Programs
5. Implementation Plan

PROPOSED SCOPE OF WORK
WMP TABLE OF CONTENTS

APPENDICES

A. O‘ahu Water Management Plan Framework

B. Plans, Policies, Guidelines, and Controls

C. O‘ahu Water Use Permit Index

D. Overview of O‘ahu Hydrogeology

E. Water Use Forecasting

PROPOSED SCOPE OF WORK

PHASE I: WATERSHED PROFILE AND INITIAL STAKEHOLDER CONSULTATIONS

- Gather, analyze, and summarize relevant data
- Gather, review, and summarize relevant plans
- Gather, review, and summarize special areas of concern (e.g., climate change, emerging technologies)
- Initial outreach to 17 Neighborhood Boards
- Conduct first round of community meetings
- Compile PUC Watershed Profile (Chapter 2)

PROPOSED SCOPE OF WORK
PHASE II: WATER DEMAND ANALYSIS

- Gather, analyze, and summarize relevant water use data for the base year of 2010
- Identify and describe three future growth scenarios, Low, Mid, High, for the year 2040
- Identify and describe an “Ultimate” future growth scenario
- Develop preliminary forecast of future water demand for each growth scenario
- Conduct second round of Neighborhood Board presentations and community meetings

PROPOSED SCOPE OF WORK

PHASE III: WATERSHED MANAGEMENT PROJECTS AND STRATEGIES

- Develop Sub-Objectives, specific to the PUC
- Identify and document up to 20 project and programs to address key water supply and watershed management issues
- Identify and document up to 20 strategies to address key water supply and watershed management issues
- Conduct third round of community meetings

PROPOSED SCOPE OF WORK
PHASE IV: IMPLEMENTATION PLAN

- Analyze and integrate all materials reviewed to date
- Identify water supply sources to meet water demands for the “most probable” and “Ultimate” water demand scenarios
- Identify short-term vs. long-term actions needed
- Identify priority and catalyst projects

PROPOSED SCOPE OF WORK

PHASE V: AGENCY AND PUBLIC REVIEW DRAFTS

- Compile Agency Review Draft
  (BWS, DPP, CWRM review)
- Review and address comments received
- Compile Public Review Draft
- Conduct final round of Neighborhood Board presentations and community meetings

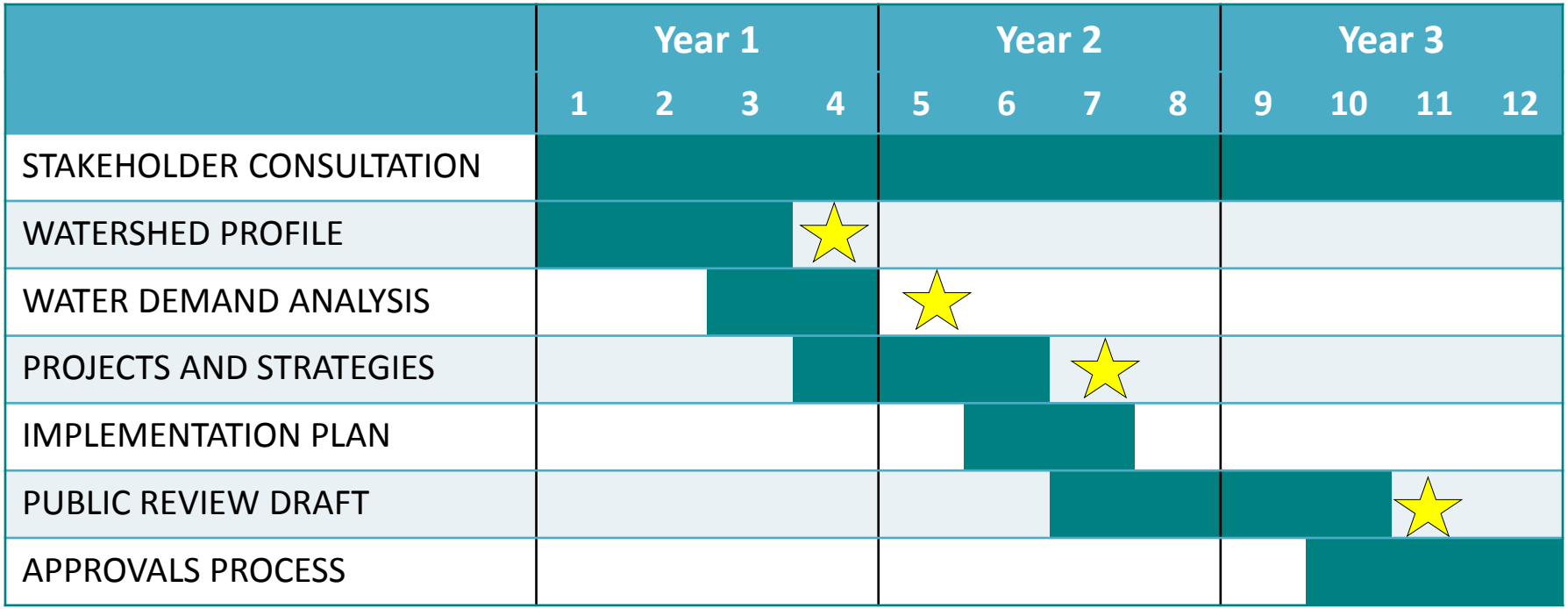
PROPOSED SCOPE OF WORK
PHASE VI: PREFINAL DRAFT AND ADOPTION

- Seek endorsement of Neighborhood Boards
- Review and address comments received on the Public Review Draft
- Compile Pre-Final Draft
- Present the PUC WMP to the BWS Chief Engineer, BWS Board, DPP, and Commission on Water Resource Management
- Coordinate and participate in the City Council adoption process
- Coordinate with CWRM staff to prepare for, conduct, and document a Public Hearing
- Coordinate and participate in the Water Commission adoption process

PROPOSED SCOPE OF WORK
Additions and Changes to Previous WMPs

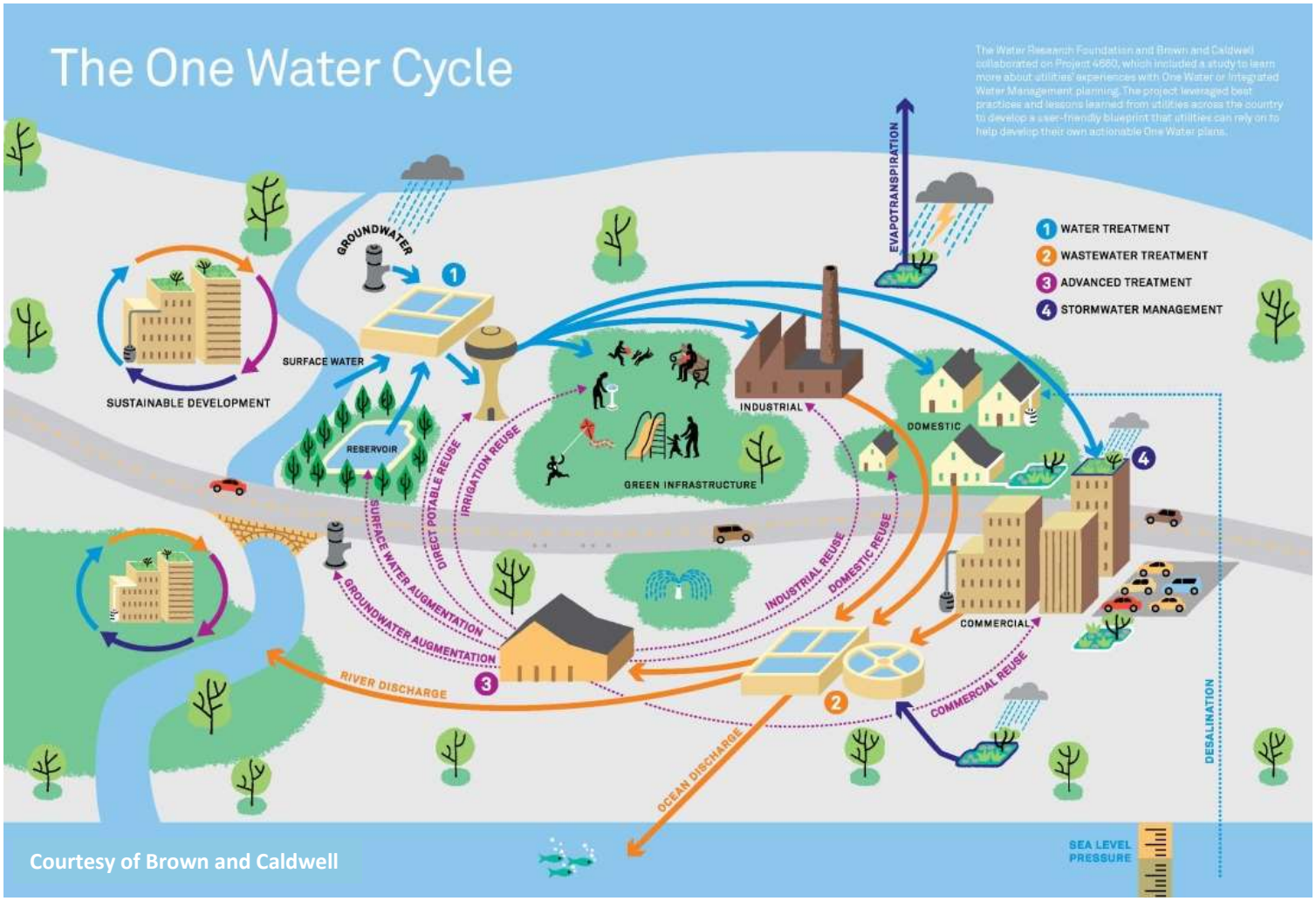
- "Ultimate" Demand Scenario
  (North Shore, ʻEwa, Central Oʻahu)
- Pre-Contact Land and Water Resources
- Traditional and Cultural Practices
  - Ka Paʻakai Assessment
- Climate Change

PUC WMP SCHEDULE



= Community Meetings

APPROACH: ONE WATER

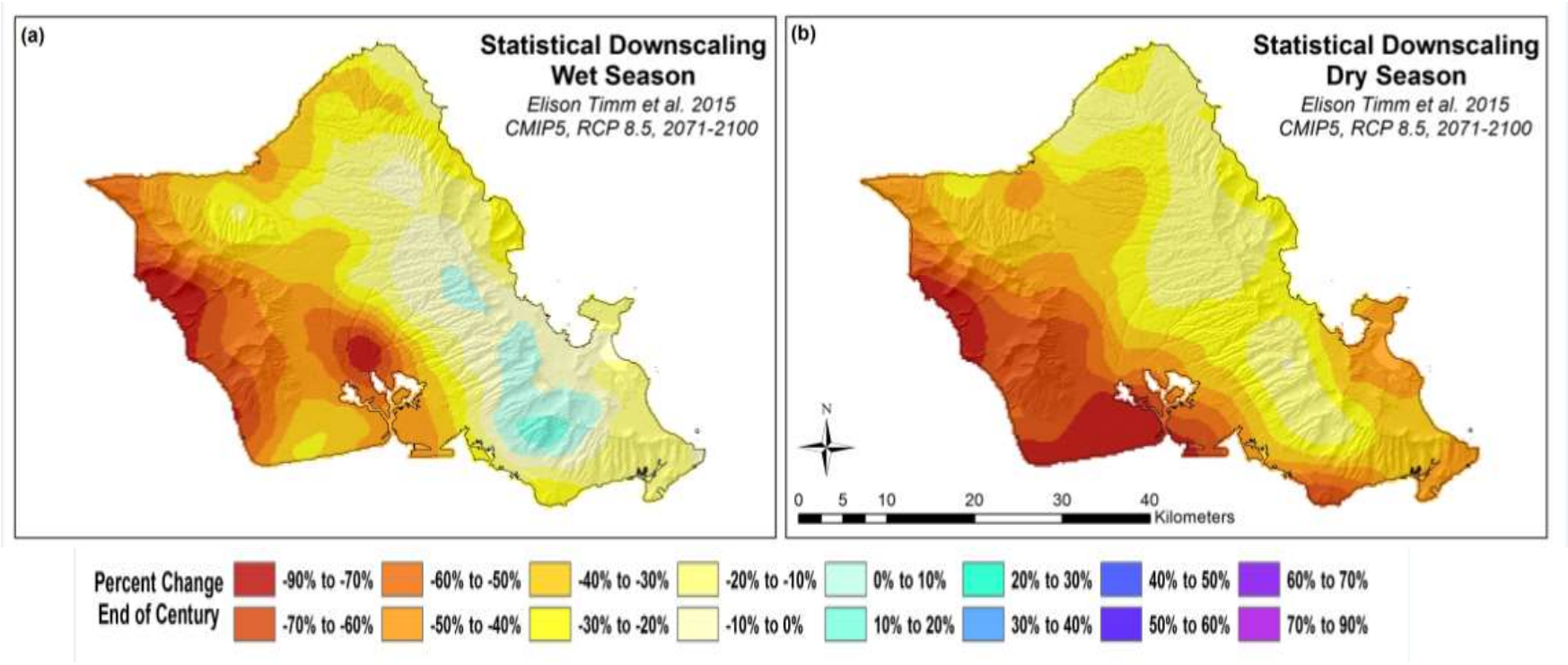


ISSUE: CLIMATE CHANGE

SUSTAIN

Rainfall: Dry areas will get drier by 2100

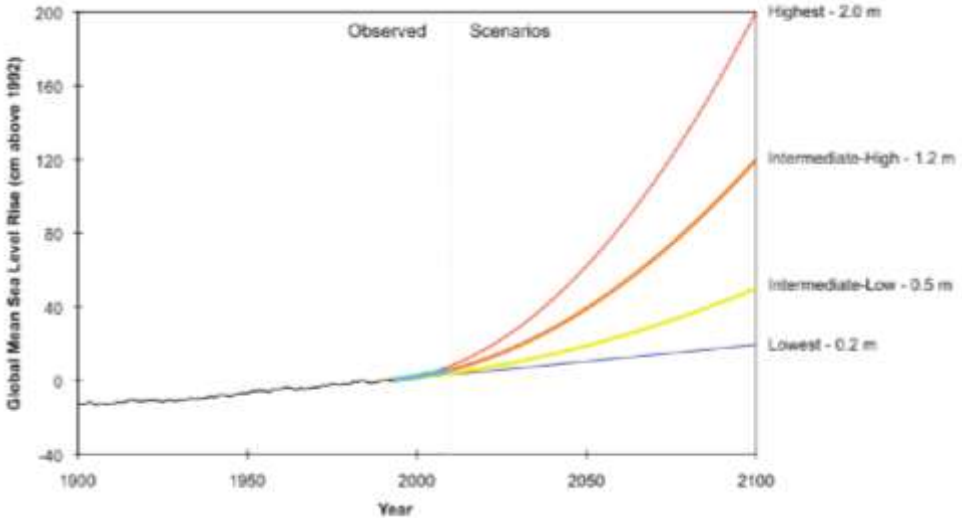
Goal: Increase watershed mgt funding to 4% of CIP or $3.3 M



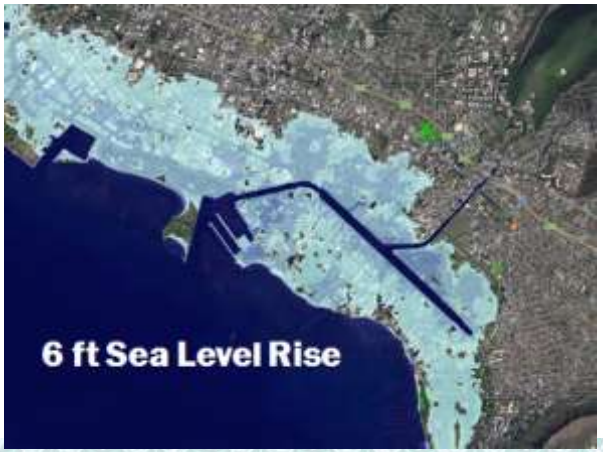
Source: Figure developed by Abby Frazier, UH. Modified from data presented in Helweg et al. 2016

ISSUE: SEA LEVEL RISE

- Sea levels are projected to rise by three to six feet by 2100
- O‘ahu’s fresh water is protected from seawater intrusion by overlying caprock
- To reduce water loss from increased corrosion, replace metallic pipelines with PVC
- SLR impacts have been modeled. Land use regulations are needed
- Coastal erosion with SLR & intense storms will impact coastal communities & infrastructure. Plans to harden or retreat are needed.



Source: Global and Regional Sea Level Rise Scenarios for the US, NOAA Jan. 2017



Source: Chip Fletcher UH 2017

ISSUE: FUTURE DEVELOPMENT

Transit-Oriented Development

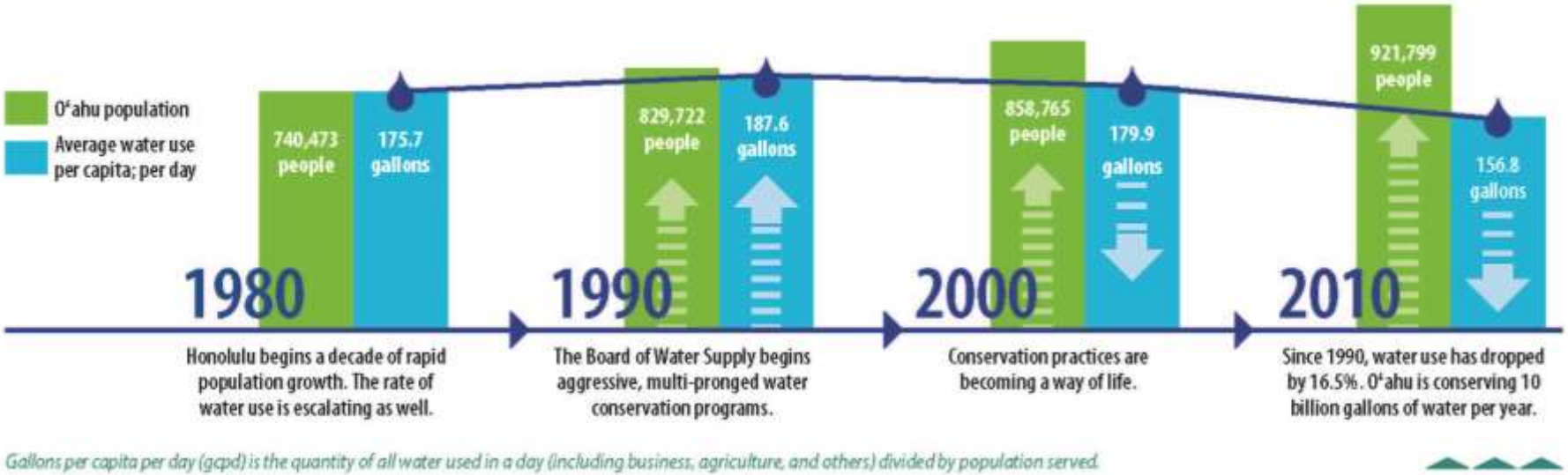
DELIVER

- Projected increase in potable water demand in the PUC (2012-2040)
  - Most probable: 1.3 MGD
  - High range: 7.0 MGD
- Met by conservation savings and import from Waipahu-Waiawa aquifer

APPROACH: CONSERVATION

Conservation, Leak Detection & Water Audits

- 10 billion gallons/year saved for other uses from 1990
- Goal: Reduce per capita demand from 157 gpcd to <145 gpcd by 2040
- Goal: Increase conservation funding to 4% of CIP or $3.3 M

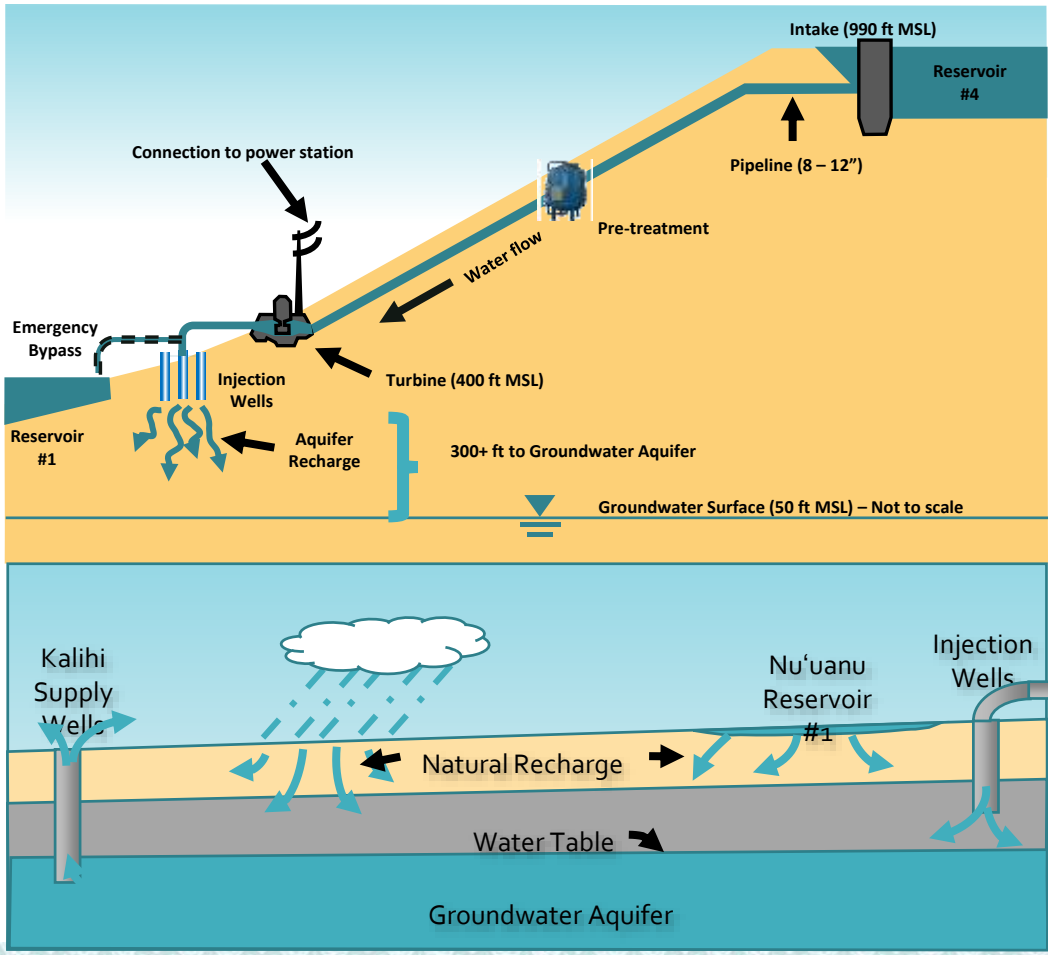


APPROACH: CAPTURE

CAPTURE

Nu‘uanu Managed Aquifer Recharge Hydro Project

- Capture storm water @ Nu‘uanu Reservoir 4
- Generate Renewable Hydro-Electric Power
- Filter & inject storm water into Kalihi Aquifer @ Nu‘uanu Reservoir 1
- Allows Kalihi Pump Station to sustain or increase pumping levels



APPROACH: REUSE

Ala Wai MBR Recycled Water Facility

- **Goal: Double Reuse by 2030**
- Replace 0.25 mgd of potable irrigation w/ recycled water
- Decrease effluent to the Sand Island WWTP.
- Feasibility-EA-RFP for Design-Build-Operate-Maintain contract

https://www.honolulu.gov/des/golf/alawai.html

ISSUE: TRADITIONAL AND CULTURAL PRACTICES

Mānoa Cultural Learning Center

SUSTAIN

- Cultural practices are being exercised, even in the highly urbanized PUC
- Goal: Create partnership to restore, farm, educate and remove invasive albizia in Mānoa
- Land survey, EA, RFP for Land License on BWS Mānoa lands

QUESTIONS

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